Review: Indian Earthquakes
Author(s): C. Davison
Review by: C. Davison
Source: *The Geographical Journal*, Vol. 38, No. 3 (Sep., 1911), pp. 307-308
Published by: geographicalj
Stable URL: http://www.jstor.org/stable/1779048
Accessed: 22-05-2016 02:01 UTC

Persia has been rapid since those days, and where Stewart travelled as a pioneer quite a host of subsequent explorers have since made the way plain—at least in maps. The spirit of careful observation and inquiry was always strong in Colonel Stewart. He could not pass Mount Ararat, for instance, without investigation into its possibilities as the resting-place of Noah's ark. He was unconvinced of the truth of its claim to this high distinction. He thought that the difficulty of getting the animals down from snow-covered and precipitous altitudes as high as Mont Blanc (apart from the question of feeding them) must invalidate the claim. He was probably right. Certainly an elephant on the top of Mont Blanc would present difficulties; but the inquiry was made with all sincerity and reverence.

Apparently Colonel Stewart only assumed the disguise of an Armenian horse-dealer to facilitate his movements when he arrived within the field of Russian or English political supervision. That he believed in his disguise as a protection from Persian inquiry is hardly possible; he was far too well acquainted with Persian methods of investigation to imagine that he could remain unrecognized as an Englishman for long. But it answered his purpose, and enabled him to make expeditions about the Afghan border which would have been impossible without some sort of disguise. Early in 1881 Colonel Stewart returned to England, and after appointment to the Consular service was deputed to Khaf (on the Afghan border of Persia) to acquaint himself with the nature of the surroundings of Herat (so far as he could), and keep an eye on Russian proceedings. Once again he returned to England, and once again made a short visit to Mashad before being invalided home in 1883 and finally despatched on political duty with the Russo-Afghan Boundary Commission under Sir Peter Lumsden. He visited Herat in the genial month of May, when two Engineer officers were deputed to revise the defence of that historic city in anticipation of a Russian siege. The siege never took place, and later, before the Russo-Afghan boundary had become a *fait accompli*, Stewart returned to his native land, and was eventually posted as Consul-General to Odessa.

If this book had been written twenty-five years ago it would have been a useful and even a remarkable record. As it is, the interest of expert opinion on the stormy question of Russia's advance in Asia has been lost, and the story can now only be regarded as a simple and pleasantly told tale of Persian travel with some useful appendices recording the geographical and (to a certain extent) the political views held a quarter of a century ago by a careful and most trustworthy observer.

T. H. H.

Indian Earthquakes.

'The Kangra Earthquake of 4th April, 1905.' By C. S. Middlemiss, B.A., F.G.S., Superintendent, Geological Survey of India. 'Memoirs of the Geological Survey of India,' vol. **38**, 1910, pp. 1–409. 30 *Plates*.

Of the two last great Indian earthquakes we now possess accounts, which are as full and detailed as the conditions of investigation would allow. Mr. Oldham's report on the Assam earthquake of 1897 treats of a disturbance of unusual magnitude and of phenomena of wide and varied interest. Mr. Middlemiss has been less fortunate in his subject, and, if his report on the Kangra earthquake of 1905 is of inferior interest and less fruitful in results, this must be attributed to the destructiveness of the shock and the heavy mortality among those who might have furnished evidence, as well as to the considerable depth of the focus, which rendered the surface manifestations of the phenomena less striking. By the surveys of the central districts, and by

numerous inquiries throughout the disturbed area, Mr. Middlemiss and his colleagues have made an important contribution to our knowledge of a great shock.

The result of their work is a large volume of more than four hundred pages, of which nearly one-half are devoted to the survey of the central area. The volume is well illustrated. There are many photographs of damaged towns and buildings, which testify to the strength of the shock and the completeness of the ruin, and a few—of much greater interest—of rock-slides and a dammed-up lake at Barwar.

Of the three maps, the most important is that which shows the courses of the inner isoseismal lines. Kangra and Dharmsala lie within the central isoseismal (No. 10), and, at these and other places, ordinary houses were reduced to flattened heaps of *débris*. The isoseismal of intensity 8, which traverses all places where slight damage occurred, consists of two detached portions, the larger surrounding the isoseismals 10 and 9, the other, lying some distance to the south-east, enclosing Dehra Dun and Mussuri. A distance of about 120 miles separates the centres of the two portions, and shows how vast is the scale of the movements which result in a great earthquake.

The extraordinary depth of the focus or foci within which these movements took place is illustrated by the entire absence of crustal changes. There were no fault-scarps, no deflection of roads or fences, and no crumpling of railway-lines. The change of elevation, indicated by the repeated levelling along a line from Saharanpur, through Mussoorie to Dehra Dun, is insignificant, being at the most about 5 inches. Mr. Middlemiss endeavoured to estimate the depth of the Kangra focus by means of Dutton's method—a method that is difficult to apply, and defective in principle. He found that it lies between 12 and 21 miles at its north-west end, and between 21 and 40 miles at the south-east end—figures that possibly serve to indicate the order of magnitude of the true depth.

To the geographer, the most interesting section of the report is that which deals with the origin of the earthquake. The two epicentres are situated on the steeply sloping convex side of the Himalayan arc, in the Tertiary rocks of the sub-Himalaya, between which and the older formations of the central ranges there runs a great boundary-fault. Throughout its extent, the sub-Himalayan band is remarkable for the evenness of its course; but in two regions the boundary fault bends sharply to the east, and sweeping round in a great curve, returns to its normal direction. It is exactly in these two regions, where the Tertiary band widens and where the strata are crushed and faulted to an unusual extent, that the two epicentres are situated. As there is practically no superficial movement perceptible, the precise fault along which the displacement occurred is unknown; but there can be little doubt that the origin of the Kangra earthquake is to be sought in a forward slide along more than 100 miles of the central Himalayan mass over the bordering Tertiary strata.

C. Davison.

AFRICA.

African Linguistics.

'Living Speech in Central and South Africa: an Essay Introductory to the Study of the Bantu Family of Languages.' By A. C. Madan, M.A. Clarendon Press, Oxford. 1911. 6*s. net.*

Mr. A. C. Madan is already well known to philologists by his admirable studies of Swahili and of the Bantu languages of Northern Rhodesia between Western Nyasaland and the Kafue river. In the work under review he animadverts,